Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of the Petitions of	)	
	)	
	)	
Constellations Communications, Inc.	)	RM-7771
TRW, Inc.	)	RM-7773
Ellipsat Corporation	)	RM-7805
American Mobile Satellite Corporation	)	RM-7806
	)	
For Amendment of Parts 2 and 25 of the	)	
Commission's Rules to Implement LEO	)	
Satellite Systems in the RDSS Bands	)	

REPLY COMMENTS

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REPLY COMMENTS

Constellation Communications, Inc. ("CONSTELLATION™"), by its attorneys, hereby submits its reply comments to the comments filed on the above-captioned rulemaking petitions.[1/]

I. CONTINUATION OF THE COMMISSION'S COMPETITIVE, OPEN ENTRY RDSS LICENSING POLICIES WILL BEST SERVE THE PUBLIC INTEREST

The petitions of CONSTELLATION, Ellipsat Corporation ("Ellipsat") and TRW, Inc. ("TRW") seek to revitalize the development of the 1610-1626.5 MHz ("L-band") and 2483.5-2500 MHz ("S-band") bands (together referred to as the "RDSS bands")

1/ The comments were filed on October 16, 1991 pursuant to the Commission's Public Notices, Report No. 1855 (August 13, 1991) and Mimeo No. 14747 (September 13, 1991).

allocated to the radio determination satellite service ("RDSS") through the introduction of new low earth orbit ("LEO") satellite technology. These three parties, together with Loral Qualcomm Satellite Services, Inc. ("LQSS"), have filed applications for such LEO systems and advocate a continuation of the Commission's competitive, open entry licensing policies in the RDSS bands to govern the Commission's consideration of these applications.

In previous pleadings, CONSTELLATION has documented the Commission's long standing policy preference to license new telecommunications systems on a competitive, open entry basis.[2/] Only the American Mobile Satellite Corporation ("AMSC") and Motorola Satellite Communications, Inc. ("Motorola") do not support such a licensing policy. AMSC seeks to establish a spectrum monopoly for its domestic mobile satellite service ("MSS") by opposing any new entrants into the RDSS bands and by requesting that the Commission assign this spectrum to the AMSC system on an exclusive basis for domestic service. Motorola proposes a multibillion dollar LEO system which it claims will require most of the available RDSS L-band

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2/ See e.g., CONSTELLATION Satellite System Application at 22-29; Petition for Rulemaking, RM 7771 at 5-10.

and seeks to establish high entry barriers that will stifle any competition in LEO-based satellite services.

Neither the AMSC nor the Motorola position is consistent with the Commission's long standing policy objectives for satellite communications established in Domsat I[3/] which have been successfully applied to stimulate competition in all aspects of the U.S. domestic satellite industry except in the case of geostationary mobile satellite services. It may be that the delays in the establishment of geostationery MSS systems in the United States are due to a lack of competition. The U.S. satellite industry is preeminent in the world today because of the competitive forces which the Commission's open entry policies fostered in the early 1970's. This current LEO licensing proceeding presents the Commission with the opportunity to reap the same benefits for new LEO technology for personal satellite communications by simply continuing the current RDSS open entry licensing policies in the RDSS bands. Moreover, to satisfy any concerns over interference between proposed systems, four of the five LEO applicants have already indicated their commitment to resolve any technical incompatibilities between their systems through technical coordination discussions.

3/ 22 FCC 2d 86 (1970).

The Commission does not have to rely on the resources of a company like Motorola or an enforced consortium with exclusive access to an allocated band to ensure that the innovative services made possible through LEO technology are provided to the public. In fact, the magnitude of cost, technical complexity and regulatory hurdles of Motorola's approach, as compared to the significantly less ambitious but eminently more practical approach of the other applicants, should give the Commission pause as to whether Motorola's Iridium project is realistic. Despite Motorola's capabilities, grant of a monopoly to Motorola will preclude development of all other systems. Yet, it is only through open entry that an emerging technology can develop in a efficient manner and serve the public interest. By providing the opportunity for open entry, the Commission will significantly increase the likelihood that at least one economically viable system will be implemented and, in the best case, that a competitive environment will emerge.

II. THE AMSC PROPOSAL TO RE-ALLOCATE THE RDSS BANDS TO MSS SHOULD BE SUMMARILY REJECTED

AMSC requests the Commission to reallocate the 1616.5-1626.5 MHz portion of the RDSS bands to MSS for use in its geostationary satellite orbit ("GSO") MSS system. AMSC seeks to pair this frequency with the previously allocated MSS

frequencies in the 1515-1525 MHz band. AMSC's position that the public interest would be better served by allocating the RDSS bands to its system is unsupportable.[4/] AMSC has already been assigned 28 MHz of spectrum in the United States on an exclusive basis[5/] and is seeking another 33 MHz in a pending application and rulemaking proceeding.[6/] Its demand for another 20 MHz of spectrum, before its first satellite is even constructed, raises serious questions as to whether AMSC is more interested in obtaining spectrum than building its system. Under such circumstances, the Commission should summarily dismiss AMSC's proposal to allocate even more spectrum to MSS. Rather, the Commission should immediately focus its attention on the introduction of LEO technology in the RDSS bands to provide new alternatives for mobile communication services.

AMSC's request for additional spectrum for its system will offer the public no new technology or service. AMSC will not increase the capacity of its system; it is not adding the satellite power needed to support a larger number of channels

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4/ AMSC Opposition at 7.

5/ See e.g., Tentative Decision, FCC 91-240 (August 2, 1991).

6/ Notice of Proposed Rulemaking, Docket 90-56, FCC 90-63 (March 5, 1990) and Application File Nos. 7/8/9-DSS-MP/ML-90.

over its system than is possible today. Nor will AMSC be able to use the RDSS frequencies to introduce personal satellite communications to handheld terminals. As a practical matter, handheld user terminals in GSO MSS systems require very high spacecraft G/Ts and EIRPs that are achievable only through large, unfurlable satellite antennas 15 or more meters in diameter. Such satellite designs will not be implemented in commercial practice for may years, if ever.

Moreover, such designs do not necessarily require additional allocations. One of the results of such a design is to substantially increase the frequency re-use capabilities of the satellite allowing more channels to be provided in the same allocated band.

The AMSC proposal is also contrary to the U.S. proposals to the 1992 World Administrative Radio Conference ("WARC"). The U.S. has rejected any MSS use of the 1515-1525 MHz band in favor of satisfying important national interests in aeronautical telemetry.[7/] If additional allocations are made

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7/ See "FCC Announces WARC-92 Strategy for Digital Audio Broadcasting," FCC News Release (October 31, 1991). While CONSTELLATION agrees with the Communications Satellite Corporation's Comments that AMSC's attempt to re-open this matter is counterproductive to the WARC efforts, CONSTELLATION does not believe an extensive rulemaking is needed for the Commission to license the pending LEO systems under the current RDSS allocations.

to MSS by the 1992 WARC, the Commission should then decide whether the public interest would be better served by assigning such new frequencies to AMSC or to new, competitive systems.

Moreover, use of the RDSS L-band by conventional MSS systems is inconsistent with the U.S. proposals that seek to add compatible MSS to the RDSS bands. The JIWP report concludes that LEO MSS systems and GSO RDSS systems are compatible, but that GSO MSS systems are not compatible with GSO RDSS systems. Nor is sharing between GSO MSS and LEO MSS systems feasible.

AMSC cannot justify additional spectrum being assigned to its system on the basis of increased customer traffic demands because it is not yet serving any customers. Nor can it justify additional spectrum on the basis of pending international coordination proceedings. While CONSTELLATION does not intend to minimize the difficulties faced by the U.S. in obtaining coordination agreements in the bands already assigned to AMSC, AMSC cannot hide behind a non-public international coordination proceeding that is not subject to public comment and review to avoid presenting a factual basis for obtaining an additional frequency allocation. No factual basis has been made in the record to support AMSC's request for additional spectrum to be assigned to its system. Moreover, AMSC's requests for additional spectrum to solve such difficulties are not only premature, but they appear to

undercut the basic ability of the U.S. to successfully negotiate any coordination agreement in the bands already assigned to AMSC. AMSC's actions effectively concede failure of the U.S. negotiation efforts at the outset.

The Commission should also reject AMSC's continuing attempts to confuse the issues in these proceedings by raising irrelevant or incorrect sharing calculations in an attempt to sidetrack the implementation of the LEO systems in the RDSS bands.[8/] In seeking to disparage the use of the RDSS bands by the other LEO applicants who are conscientiously seeking to resolve the sharing issues in these bands, AMSC completely ignores the same types of sharing issues that are created by its own proposal.[9/]

8/ The Committee on Radio Frequencies of the National Academy of Sciences - National Research Council is the only party currently using the RDSS bands who filed comments regarding sharing issues. CONSTELLATION is concerned that these comments may be advocating unnecessarily stringent protection criteria but intends to cooperate with the radioastronomy community in developing the necessary sharing and coordination arrangements between radioastronomy and LEO systems in the RDSS bands.

9/ For example, Table 1 to AMSC's "Technical Appendix" addresses the worst case when the redundant transmitters are operated in parallel. The normal case would be 3 dB lower and comply with the current power flux density limit. Table 2 overstates the required separation distance because the EIRP towards the horizon it assumes is 1.5 db too high and because it assumes 3 times too many carriers falling within the 20 kHz observation bandwith. Table 4 overstates interference levels because it assumes a higher power flux density level than will be produced by the CONSTELLATION system. Table 5 overstates interference into a radionavigation-satellite receiver because it uses an overly conservative technique of comparing interference to thermal noise level, rather than calculating the

III. THE COMMISSION SHOULD REJECT MOTOROLA'S ATTEMPTS TO ERECT HIGH BARRIERS TO COMPETITIVE ENTRY OF LEO SYSTEMS INTO THE RDSS BANDS

Motorola opposes the petitions of CONSTELLATION, Ellipsat and TRW by arguing that they are unnecessary, time consuming and contrary to the public interest.[10/] Yet, Motorola would have the Commission use its waiver procedures to completely re-write its current RDSS policies and rules as well as most of the underpinnings for its satellite licensing policies established during the past two decades. Specifically, Motorola would have the Commission allow new bi-directional use of the RDSS L-band, erect high barriers to competitive entry into the market by imposing much more stringent financial and other qualification standards on

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degradation to Eb/No produced by interference, and because the processing rejection factor is too low. Table 6 overstates interference into an AMSS(R) C-channel because practical aircraft terminals will transmit such a channel at 25.5 dBW providing a C/I of at least 19.5 dB. Table 7 is arbitrary and unsupported, and should be rejected in light of the link budgets presented in Appendix C to CONSTELLATION's application which fully support the capacity estimates for its system.

10/ Motorola Comments at 1 and 6-7.

applicants than required by current Commission rules, and impose comparative hearing proceedings, with all of these charges accomplished, under the waivers requested by Motorola.[11/] While the case cited by Motorola for waiver standards[12/] may be applicable to a single applicant in the absence of competing applicants for the spectrum, the Commission cannot engage in a wholesale reshaping of its satellite licensing procedures under the guise of the waivers requested by a single applicant when there are competing applicants who are just as qualified as Motorola under the current licensing standards in these bands.

While Motorola disavows a request for an exclusive assignment of frequencies for its Iridium system,[13/] Motorola does not deny that the practical effect of granting its application would be a de facto exclusive license. Motorola apparently concedes[14/] that a portion of the RDSS spectrum may be sufficient for a smaller, less expensive system, such as the one proposed by CONSTELLATION, but then it unilaterally proclaims a need for 10.5 MHz for its system. By declaring the

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11/ Id. at 8.

12/ Id. at 7.

13/ Id. at 15.

14/ Id. at 16.

lower 6 MHz out of the total 16.5 MHz in the RDSS L-band as unusable because of sharing considerations, Motorola is in effect asking for an exclusive assignment of the RDSS L-band for the Iridium system despite its protestations to the contrary.

Viewed in any context, the Iridium system being proposed by Motorola is unprecedented in terms of the financial, technical, institutional, legal, and marketing challenges it presents to the Commission and the world. In light of the risk being faced by Motorola, it is only natural that Motorola would seek protection of its plans and market position by erecting high barriers to entry by competing LEO systems. However, such barriers to competitive entry by other companies cannot in fact guarantee that Motorola's vision will in fact come to pass.

Motorola's Iridium system presents significant technical, financial, and market risks. Moreover, the global institutional arrangements needed to establish a $3.2 billion venture is likely to result in a monolithic global LEO service provider that could place anticompetitive constraints on the development of U.S. industry. Such market forces lead companies such as CONSTELLATION to build less expensive LEO satellite designs in the initial generation of LEO satellites while traffic levels are small. It is likely that higher capacity satellites, such as those proposed by Motorola, will

be unfilled for a good percentage of their lifetime. This may ultimately lead Motorola to downsize its initial system design. The Commission should not allow Motorola to use its current market position to exclude competitors with more realistic system implementation plans, and then take advantage of the lack of competitors to later downsize its system to meet more realistic market conditions.

IV. THE RECORD ALREADY ESTABLISHED IN THIS PROCEEDING PROVIDES A SOUND BASIS TO PROMPTLY APPROVE ALL OF THE PENDING LEO APPLICATIONS UNDER THE COMMISSION'S CURRENT RDSS COMPETITIVE, OPEN ENTRY POLICIES

The petitions for rulemaking filed by CONSTELLATION, Ellipsat and TRW are very similar in their scope and effect. It should not be difficult for the Commission to reconcile the minor differences among them and promulgate an open entry LEO licensing policy in the RDSS bands that would permit the Commission to promptly grant all of the applications and allow market forces, not regulatory selection criteria, to shape the implementation of this new LEO technology for personal satellite communications.

CONSTELLATION's petition for rulemaking is not intended to produce a wholesale revision of the Commission's current RDSS licensing policies, as advocated by AMSC and Motorola. Rather, CONSTELLATION's petition for rulemaking was filed in the spirit of the Commission's landmark domestic

satellite proceedings. For example, the Commission simultaneously issued DOMSAT I establishing a competitive, open entry licensing policy and at the same time inviting applications to be filed.[15/] The principal reason for having a parallel rulemaking and application process was to use the rulemaking powers of the Commission to resolve potential conflicts between applicants in the context of concrete proposals for satellite systems implementing the new technology. The same conditions exist here. CONSTELLATION believes the DOMSAT policies provide a solid framework for considering LEO applications. It urges the Commission to promptly accept and process the pending LEO applications and to use its rulemaking powers only as necessary to refine the technical basis for continuing its competitive, open entry licensing policies.

If such a rulemaking is needed to complement the coordination efforts of the pending LEO applicants, it can be limited to a few technical issues, such as LEO modulation and multiple access techniques, power flux density levels, and feeder link and inter-satellite link coordination.

15/ Report and Order, 22 FCC 2d 86 (1970) and Notice of Proposed Rulemaking, 22 FCC 2d 810 (1970).

TRW opposes CONSTELLATION's suggestion that the Commission initially assign each LEO applicant 2 MHz of spectrum in the RDSS L-band "because it would have the effect of precluding all systems of a design other than CONSTELLATION's."[16/] This was not the intent of this proposal. In preparing its application, CONSTELLATION developed a licensing proposal that would permit the authorization of multiple LEO systems in the RDSS bands based on the information then available to it in the Ellipsat and Motorola applications. Since Ellipsat divided the RDSS spectrum into relatively narrow channels, each supporting code division multiple access, and Motorola used a frequency division/time division multiple access scheme, CONSTELLATION advanced a band segmentation scheme in the RDSS L-band as a possible approach to licensing multiple systems. This does not mean that CONSTELLATION is opposed to other technical approaches to achieve multiple entry in the RDSS bands.

CONSTELLATION remains committed to supporting a multiple entry licensing policy, and believes that further technical analyses are needed to determine the compatibility between the modulation scheme and frequency plan proposed by CONSTELLATION and those proposed by the other LEO applicants.

16/ TRW Comments at page 4.

Based on the results of such analyses, as well as coordination among the applicants, the Commission can reserve its jurisdiction to approve any mutually agreeable coordination arrangements worked out among the LEO operators, or use its retained rulemaking authority to specify minimum technical standards relating to modulation, access techniques and power levels needed to accommodate the various LEO systems.

V. CONCLUSION

CONSTELLATION believes that this proceeding offers the Commission the opportunity to revitalize the development of the RDSS bands by authorizing LEO satellite systems in these bands. The RDSS bands are the only ones currently available for providing a full range of personal satellite communications services, including voice, data and facsimile. LEO systems can be implemented on a compatible basis with RDSS as established under current Commission rules. Moreover, the current LEO applications provide a basis for the Commission to introduce this service promptly on a competitive, open entry basis and avoid the delays and administrative costs to the Commission and the public that have surrounded AMSC's efforts to establish a domestic MSS monopoly. For the reasons set forth above, CONSTELLATION believes that an adequate record has already been established for the Commission to begin immediately with the licensing of new, competitive LEO systems in the RDSS bands to

insure the early introduction of this new technology to satisfy personal and business communications needs both in this country and on a global basis.

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CERTIFICATE OF SERVICE

I, Robert A. Mazer, hereby certify that a copy of the foregoing reply comments of Constellation Communications, Inc. were sent by first class United States mail, postage prepaid, this 14th day of November, 1991, to the following:

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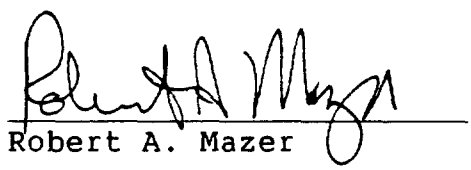

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